

Part IV. Plant Assessment Form

For use with "Criteria for Categorizing Invasive Non-Native Plants that Threaten Colorado's Wildlands and Agriculture"

By the Colorado Noxious Weed Advisory Committee

Electronic version: December 4, 2008

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Mesembryanthemum crystallinum L.
Synonyms:	Cryophytum crystallium
Common names:	crystalline iceplant, common iceplant
Evaluation date (mm/dd/yy):	1-20-10
Evaluator #1 Name/Title:	Michael Ostlie, Graduate Research Assistant
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Section below for list committee use—please leave blank

List committee members:	enter text here
Committee review date:	enter text here
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

enter text here

Table 2. Criteria, Section, and Overall Scores

<u>1.1</u>	Impact on abiotic ecosystem processes	B	Rev'd, Sci. Pub'n	Impact <i>Enter four characters from Q1.1-1.4 below:</i> BBCD <i>Using matrix, determine score and enter below:</i> B	Wildlands Plant Score <i>Using matrix, determine Overall Score and Alert Status from the first, second, and third section scores and enter below:</i> Limited No Alert	
<u>1.2</u>	Impact on plant community	B	Rev'd, Sci. Pub'n			
<u>1.3</u>	Impact on higher trophic levels	C	Rev'd, Sci. Pub'n			
<u>1.4</u>	Impact on genetic integrity	D	Observational			
<u>2.1</u>	Role of anthropogenic and natural disturbance	B (2 pts)	Rev'd, Sci. Pub'n	Invasiveness <i>Enter the sum total of all points for Q2.1-2.7 below:</i> 10 <i>Use matrix to determine score and enter below:</i> C		
<u>2.2</u>	Local rate of spread with no management	C (1 pt)	Other Pub. Mat'l			
<u>2.3</u>	Recent trend in total area infested within state	C (1 pt)	Anecdotal			
<u>2.4</u>	Innate reproductive potential <u>Wksht A</u>	B (2 pts)	Other Pub. Mat'l			
<u>2.5</u>	Potential for human-caused dispersal	B (2 pts)	Anecdotal			
<u>2.6</u>	Potential for natural long-distance dispersal	C (1 pt)	Rev'd, Sci. Pub'n			
<u>2.7</u>	Other regions invaded	C (1 pt)	Rev'd, Sci. Pub'n			
<u>3.1</u>	Ecological amplitude/Range	C	Anecdotal	Distribution <i>Using matrix, determine score and enter below:</i> D		
<u>3.2</u>	Distribution/Peak frequency <u>Wrksht B</u>	D	Observational			

<u>4.1</u>	Poisonous to livestock	C (1pts)	Other Pub. Mat'l
<u>4.2</u>	Detrimental to economic crops	D (0 pts)	Other Pub. Mat'l
<u>4.3</u>	Detrimental to management of agricultural system, rangeland and pasture	C (1 pt)	Rev'd, Sci. Pub'n
<u>4.4</u>	Human impacts <u>Wrksht C</u>	D (0 pts)	Other Pub. Mat'l

Agricultural / Human Impact

Enter the sum total of all points for Q4.1-4.4 below:

2

Use matrix to determine score and enter below:

C

Agricultural Plant Score

Using matrix, determine Overall Score and Alert Status from the second, third and fourth section scores and enter below:

Limited

No Alert

Table 3. Documentation

Question 1.1 Impact on abiotic ecosystem processes	B Rev'd, Sci. Pub'n back
Identify ecosystem processes impacted: Soil salt accumulation, plant carcass light blocking.	
Rationale: Salt accumulates in biomass then releases back to the soil when plant deteriorates via leaching (1). Biomass also can prevent new seedling emergence by blocking light and taking years to decompose (1) (2).	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318. 2. California Invasive Plant Council. 1-24-10. http://www.cal-ipc.org/ip/management/plant_profiles/Mesembryanthemum_crystallinum.php .	
Question 1.2 Impact on plant community composition, structure, and interactions	B Rev'd, Sci. Pub'n back
Identify type of impact or alteration: inhibition of emergence of other species due to light blockage and salt accumulation.	
Rationale: area surrounding ice plant litter will favor germination of salt tolerant species, such as itself, including most grass seedlings (1). Light blockage due to dense litter mats and long decomposition times can also inhibit seedlings (1). Dense stands generally not a problem	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318.	
Question 1.3 Impact on higher trophic levels	C Rev'd, Sci. Pub'n back
Identify type of impact or alteration: Ice plant displaces preferable feeding by native mammals.	
Rationale: Species will only feed on ice plant when other vegetation is removed.	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318.	
Question 1.4 Impact on genetic integrity	D Observational back
Identify impacts: none documented	
Rationale: no native relatives	
Sources of information: United States Department of Agriculture Plant Profile. 1-24-10. http://plants.usda.gov/	

Question 2.1 Role of anthropogenic and natural disturbance in establishment	B Rev'd, Sci. Pub'n back
Describe role of disturbance: Disturbed areas or areas of sparse native vegetation are preferred for infestation.	
Rationale: Does not penetrate or grow well in established systems.	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318.	
Question 2.2 Local rate of spread with no management	C Anecdotal back
Describe rate of spread: likely slow	
Rationale: Coastal areas are most vulnerable to infestation, although wetlands/riparian could potentially support the species.	
Sources of information: Calflora. 1-24-10. http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=5460	
Question 2.3 Recent trend in total area infested within state	C Other Pub. Mat'l back
Describe trend: none noted	
Rationale: This species is presently sold as an ornamental and is the only known population in the state.	
Sources of information: United States Department of Agriculture Plant Profile. 1-24-10. http://plants.usda.gov/	
Question 2.4 Innate reproductive potential	B Other Pub. Mat'l back
Describe key reproductive characteristics: Annual lifecycle; once introduced can quickly overtake a suitable area.	
Rationale: plants can germinate and flower year long, creating more opportunities for seed production although season long production is uncommon	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318. 2. Australian center for plant biodiversity research. 1-24-10. http://www.anbg.gov.au/cpbr/WfHC/Mesembryanthemum/index.html	
Question 2.5 Potential for human-caused dispersal	B Anecdotal back
Identify dispersal mechanisms: can be sold as ornamental or move into grazed grasslands	

Rationale: There is potential for escape from nurseries or households.	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318.	
Question 2.6 Potential for natural long-distance dispersal	C Rev'd, Sci. Pub'n back
Identify dispersal mechanisms: Mainly dispersed by small mammals feeding on it.	
Rationale: Seed spread is the most common dispersal mechanism.	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318.	
Question 2.7 Other regions invaded	C Rev'd, Sci. Pub'n back
Identify other regions: Chile (1), California (2), Arizona (2), Australia (3)	
Rationale: Mostly invasive in coastal areas.	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318. 2. United States Department of Agriculture Plant Profile. 1-24-10. http://plants.usda.gov/ . 3. Kloot, P.M. 1983. The role of common iceplant (Mesembryanthemum crystallinum) in the deterioration of medic pastures. Australian Journal of Ecology. 8:301-306.	
Question 3.1 Ecological amplitude/Range	D No Information back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Amplitude would be limited to grasslands (mostly riparian areas) or escapes from gardens/nurseries in Colorado, although no presence has been documented..	
Rationale: No information is present for Colorado specifically, but based on information, spread would likely be limited to disturbed, saline grassland areas.	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318.	
Question 3.2 Distribution/Peak frequency	U Observational back
Describe distribution: Current known distribution is low	
Rationale: no large populations have been documented in the state, only documented plants are ornamentals	

Sources of information: 2. United States Department of Agriculture Plant Profile. 1-24-10. http://plants.usda.gov/ .	
Question 4.1 Poisonous to Livestock	C Other Pub. Mat'l back
Describe impacts in terms of high probability of death, long-term health impacts, or short-term health impacts: low	
Rationale: plant contains oxalic acid and some relatives can be poisonous, however, this species has not been linked to any livestock health problems to date.	
Sources of information: Western Australian Department of Food and Agriculture. 1-24-10. http://www.agric.wa.gov.au/PC_93107.html?s=1001	
Question 4.2 Detrimental to Economic Crops	D Other Pub. Mat'l back
Describe impacts to all aspects of cropping systems (see guidelines): Generally does not infest cropping systems in the United States	
Rationale: Mostly documented in coastal areas/wet grasslands	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318. 2. United States Department of Agriculture Plant Profile. 1-24-10. http://plants.usda.gov/ . 3. Kloot, P.M. 1983. The role of common iceplant (mesembryanthemum crystallinum) in the deterioration of medic pastures. Australian Journal of Ecology. 8:301-306. 4. Calflora. 1-24-10. http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=5460	
Question 4.3 Detrimental to Mgmt of Agricultural System, Rangeland and Pasture	C Rev'd, Sci. Pub'n back
Describe impacts to water diversion systems, increased water use, reduced forage for livestock: Forage quality reduction, increased salt content, carcass leaves a dense mat of biomass	
Rationale: Plant is not preferred by livestock, but will be consumed when no other options are available. Litter from ice plant increases soil salt content and dense mats can prevent emergence of other species.	
Sources of information: 1. Vivrette, N.J. and C.H. Muller. 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs. 47:301-318. 2. Kloot, P.M. 1983. The role of common iceplant (mesembryanthemum crystallinum) in the deterioration of medic pastures. Australian Journal of Ecology. 8:301-306.	

Question 4.4 Human Health Impacts	D Other Pub. Mat'l back
Describe key human impacts such as; irritants, property values, recreational values, and industry impacts: very little negative impact to human activities	
Rationale: seeds are edible, used as ornamental, does not form dense stands	
Sources of information: 1. Australian Center for Plant Biodiversity Research. 1-24-10. http://www.anbg.gov.au/cpbr/WfHC/Mesembryanthemum/index.html	

Worksheet A

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Reaches reproductive maturity in 2 years or less	Yes: 1 pt
Dense infestations produce >1,000 viable seed per square meter	Unknown: 0 pts
Populations of this species produce seeds every year.	Yes: 1 pt
Seed production sustained over 3 or more months within a population annually	No: 0 pt
Seeds remain viable in soil for three or more years	Yes: 2 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	No: 0 pt
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	No: 0 pt
Fragments easily and fragments can become established elsewhere	No: 0 pts
Resprouts readily when cut, grazed, or burned	Unknown: 0 pts
	Total Pts 2 unknowns
	B (4-5 pts)
Note any related traits: enter text here	

Worksheet B - Colorado Ecological Types and Land Use

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Major Ecological and Land Use Types	Minor Ecological and Land Use Types	Code*
Freshwater and Aquatic Systems	lakes, ponds, reservoirs	score
	rivers, streams, canals	score
Riparian and wetlands	Riparian forest	score
	Riparian shrublands	Unknown
	Wet meadows	Unknown
Grasslands	Shortgrass prairie	Unknown
	Tallgrass prairie	score
	Sandsage prairie	score
	Montane meadows	score
Irrigated Agriculture	Hay meadows	score
	Irrigated crops (alfalfa, corn, sugar beets)	score
Dryland Agriculture	Dryland crops (wheat, corn, millet, dryland grass hay, sunflowers, mustard for biodiesel)	score
Developed Lands	Urban, exurban, industrial	Unknown
Arid Shrublands	Sagebrush shrublands	score
	Foothills shrublands	score
	Gambel oak shrublands	score
Woodlands	Pinyon - juniper	score
	Ponderosa pine	score
	Limber pine	score
Forest	Lodgepole pine	score
	Spruce-fir	score
Alpine	Boulder and rock fields	score
	Dwarf shrublands	score
	Tundra	score
Barrens (lower elevation)	Dunes	score
	Rock outcrops	score
	Canyonlands	score

* A. means >50% of type occurrences are invaded; B means >20% to 50%; C. means >5% to 20%; D. means present but ≤5%; U. means unknown (unable to estimate percentage of occurrences invaded).

Worksheet C – Human Impacts

Human health impacts; irritants (sap), spines, poisonous, and/or smoke impacts	No: 0 pt
Property values are decreased due to increased risk of fire	No: 0 pts
Decreased property value due to moderate to heavy infestations	No: 0 pts
Decreased land value for recreational use; boating, fishing, camping, etc.	No: 0 pts
Impact of listing detrimental to industry; agriculture, horticulture, nursery, and/or seed	No: 0 pt
	Total Pts Total Unknowns
	D (0 pts)
Note any related traits: enter text here	